DETAILED ACTION

Response to Amendment and Arguments

Applicant's amendment and corresponding arguments, filed 8 August 2007, have been reviewed and considered. Claims 1-5 and 7-10 have been amended, claim 11 has been added, and claim 6 has been canceled. Therefore, claims 1-5 and 7-11 are currently pending. Applicant's arguments with respect to the amendment have been considered but are moot in view of the new ground(s) of rejection (Refer to Office Action below). Note that the applicant's sole argument is regarding the "modular measuring head".

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 1, 7 and 11 rejected under 35 U.S.C. 103(a) as being unpatentable over TULLIS (U.S. Patent 6,118,132).

Regarding claims 1 and 11, TULLIS discloses a measuring device (10) in which discrete signals can be produced at discrete points in time occurring in a periodic sequence, by means of positional determination of one or more identifiable points or positions which are located on a moved surface (14) and within a two dimensional

measuring window (area below measuring device) of the measuring device (Col. 5, Lines 22-38) (Col. 7, Lines 14-34). TULLIS discloses these signals being able to be evaluated for determining an interval which can be associated with the changes in position of the identifiable positions (Col. 5, Lines 22-38) (Col. 7, Lines 14-34). TULLIS discloses a light source (28; Fig. 7) for oblique illumination of the moved surface within the measuring window, an image sensor (16, 18, 24) and an electric circuit (last paragraph of column 6) being integrated in the measuring device for affecting a pattern recognition, in that the identifiable positions can be defined by the pattern recognition (Figures 6 and 7). TULLIS discloses the positions of at least some of these positions being determined at two sequential points in time of said sequence, in that the interval associated with the changes in position can be calculated at each of the discreet points in time and thus the length of a path traveled by the moved surface and its speed can be determined at these points in time (Summary) (Col. 5, Lines 22-38) (Col. 7, Lines 14-34) (Abstract). However, TULLIS fails to disclose the light source, the image sensor and the electric circuit within a modular measuring head. Note that TULLIS makes no mention of a casing or how the components thereof are attached to one another.

It is old and known in the art for measuring device components (including a light source, sensor and circuit/processing unit) to be enclosed within a modular measuring head or singular housing case in order to protect the electric/optical components from human/environmental elements while also providing an aesthetically pleasing appearance (i.e. hiding electrical/optical components, wiring, etc). In response to the applicant arguments, note that the distance (d) between the photosensor arrays (16, 18)

can be any distance based on personal preference (large or small). Regardless, a housing case (measuring head) is known to extend many different distances to include all components in order to provide an overall aesthetically pleasing appearance. Also note that even though TULLIS fails to mention a casing/housing or a modular measuring head, it is inherent some kind of housing/support is holding the electrical and optical components thereof. Accordingly, it would have been obvious to a person with ordinary skill in the art at the time the invention was made to have provided the measuring device of TULLIS with a modular measuring head/housing/case holding the electrical and optical components thereof in order to protect the components from human/environmental elements while also providing an aesthetically pleasing appearance.

Regarding claim 7, TULLIS discloses an image processor being used to produce quadrature signals corresponding to the changes in position wherein a length of a path traveled by the moved surface and its speed is determined at the discreet points in time from the quadrature signals by means of electronic calculation (Col. 6, Lines 16-37).

Claims 2-4 and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over TULLIS (U.S. Patent 6,118,132) in view of SCHAEFER (DE 19900581 A1).

Regarding claims 2-4, TULLIS discloses a measuring device that can determine the length of a path traveled by a moved surface and its speed as discussed above. However, TULLIS fails to disclose the moved surface being a warp thread for a weaving

machine. TULLIS actually discloses that the moved surface can be any surface or web of material.

SCHAEFER teaches a measuring device for determining both a length traveled and speed of a thread in a textile process in order to detect deformities in a thread early during a textile process, thus saving time and money (Abstract). The applicant further states in the specification that it is commonly known in the art to determine the speed of warp threads in a weaving machine by means of a correlation process as described in EP-A-1003579 (patent family of DE 19900581 A1) and by other means such as a three-point deflection process or a Doppler Effect process (First page of applicant's specification). Accordingly, it would have been obvious to one with ordinary skill in the art to use the measuring device of TULLIS wherein the moved surface is represented by warp threads of a weaving machine in order to provide a device to detect deformities in a thread early during a textile process.

As discussed above, TULLIS in view of SCHAEFER teaches a measuring device for determining both a length traveled and speed of a thread in a weaving machine. However, TULLIS in view of SCHAEFER fails to teach the positioning of the measuring device in the weaving machine. As discussed above, the purpose of having a measuring device that determines a length traveled and speed of a warp thread is to detect deformities in the thread so these deformities can be corrected at an earlier stage of a weaving process, thus saving time and money. It is well known to a person with ordinary skill in the art that similar and different thread deformities can appear in the thread throughout the weaving process and these deformities must be corrected in

different positions of the weaving machine. Therefore it would have been obvious to one with ordinary skill in the art at the time the invention was made to have provided the measuring device of TULLIS in view of SCAEFER above the thread at different positions and between different components of a weaving machine (the specific types of components of a weaving machine are inherent) in order to detect deformities when they appear so the problems can be corrected before larger issues arise. In specific regards to claim 2, an element can be considered any weaving machine component located near the measuring device such as a type of roller.

Claim 8 is rejected under 35 U.S.C. 103(a) for the same reasons as discussed above. The speed of the warp threads as discussed above is considered to be an intermediate speed.

Regarding claim 9, TULLIS discloses determining the mean speed of the moving surface with the use of a filter (Col. 6, Lines 51-54) (Col. 8, Lines 29-37). The filter as discussed in TULLIS is used to further improve detection of inherent structure-related properties, which aids in determining speed of the moving surface. It was determined to be obvious by TULLIS in view of SCAEFER for the moved surface to be warp threads as discussed above. For future reference, SCHAEFER also discloses the use of a frequency filter (Abstract).

Regarding claim 10, TULLIS discloses that a reverse movement of the moved surface is compensated for without error by filtering and time synchronized sampling with the weaving machine cycle. The phrase "reverse movement" is considered to mean a slowing movement, such as speed of a warp thread that is slowing down

compared to the previous speed. The time-synchronized sampling of the measuring device is discussed above wherein positional determination of two points, at particular points in time, are determined for a warp thread. The filter as discussed in claim 9 aids in determining positional determination more accurately.

Allowable Subject Matter

Claim 5 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NATHAN E. DURHAM whose telephone number is (571)272-8642. The examiner can normally be reached on Monday - Friday, 7:30 am - 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary L. Welch can be reached on (571) 272-4996. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

NED

/GARY L. WELCH/
Supervisory Patent Examiner, Art Unit 3765